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COMPOSITE SEMICONDUCTOR DEVICE AND ITS MANUFACTURING METHOD

Inventor:	Masayoshi Noda Sony Corporation 6-7-35 Kitashinagawa, Shinagawa-ku, Tokyo
Applicant:	000002185 Sony Corporation 6-7-35 Kitashinagawa, Shinagawa-ku, Tokyo
Agents:	Akira Koike, patent attorney, and 2 others

[There are no amendments to this patent.]

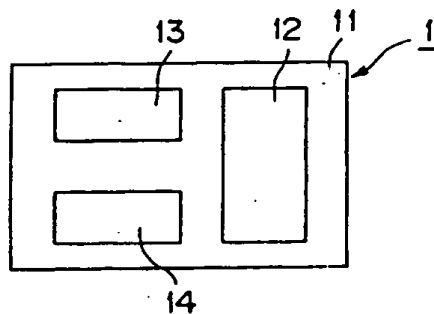
Abstract

Objective

To integrate each semiconductor device by integrating them on one chip, to realize a substantial small-scale and high integration level, to be able to realize a large manufacture cost reduction, compared with a conventional composite semiconductor device, and to greatly improve the reliability of the quality of the product and its yield.

Constitution

It is constituted by different semiconductor devices of logic circuit 11, CPU 12, DRAM 13, and flash memory 14, with the functional surfaces of the CPU 12, DRAM 13, and flash memory 14, which are for each semiconductor device, being attached with a solder, connected with a wiring, and made into a composite (one-chip processing).



Claims

1. A composite semiconductor device characterized by the fact that several semiconductor devices having at least two or more different attributes are attached in a bare chip state and connected with a wiring.

2. The composite semiconductor device of Claim 1, characterized by the fact that the above-mentioned attributes are circuit functions.

3. The composite semiconductor device of Claim 1, characterized by the fact that the above-mentioned attributes are manufacturing processes.

4. The composite semiconductor device of Claim 1, characterized by the fact that the above-mentioned attributes are structures.

5. The composite semiconductor device of Claim 1, 2, 3, or 4, characterized by the fact that on the functional surface of the semiconductor device with the maximum size among the above-mentioned several bare-chip semiconductor devices, at least one semiconductor device or more with the same size as or smaller than said semiconductor device is attached.

6. The composite semiconductor device of Claim 1, 2, 3, 4, or 5, characterized by the fact that it is constituted by attaching the functional surface of the above-mentioned semiconductor device with the maximum size and the functional surfaces of each of the other semiconductor devices so that they face each other.

7. The composite semiconductor device of Claim 5 or 6, characterized by the fact that wiring connecting parts are installed on the functional surface of the above-mentioned

semiconductor device with the maximum size and on the functional surfaces of each of the above-mentioned semiconductor devices; and that said wiring connection parts are electrically connected.

8. The composite semiconductor device of Claim 1, 2, 3, 4, or 5, characterized by the fact that it is constituted by attaching the functional surface of the above-mentioned semiconductor device with the maximum size and the nonfunctional surface of each of the other above-mentioned semiconductor devices among the above-mentioned several bare-chip semiconductor devices so that they face each other.

9. The composite semiconductor device of Claim 8, characterized by the fact that after the functional surface of the above-mentioned semiconductor device with the maximum size and the nonfunctional surface of each of the other above-mentioned semiconductor devices are attached so that they face each other, wiring connecting parts, which are respectively installed on the functional surface of the above-mentioned semiconductor device with the maximum size and the functional surface of each of the other above-mentioned semiconductor devices, are electrically connected.

10. A manufacturing method of the composite semiconductor device, characterized by the fact that on the functional surface of the semiconductor device with the maximum size among several bare-chip semiconductor devices having at least two or more different attributes, at least one or more semiconductor devices with the same size as or smaller than said semiconductor device is formed by attaching.

11. The manufacturing method of the composite semiconductor device of Claim 10, characterized by the fact that the functional surface of the semiconductor device with the maximum size and the

functional surfaces of each of the other semiconductor devices are formed by attaching so that they face each other.

12. The manufacturing method of the composite semiconductor device of Claim 10, characterized by the fact that among several bare-chip semiconductor devices having at least two or more different attributes, the functional surface of the semiconductor device with the maximum size and the nonfunctional surfaces of each of the other above-mentioned semiconductor devices are formed by attaching so that they face each other.

13. The manufacturing method of the composite semiconductor device of Claim 10 or 11, characterized by the fact that wiring connecting parts are installed on the functional surface of the above-mentioned semiconductor device with the maximum size and on the functional surfaces of each of the other above-mentioned semiconductor devices; and that said wiring connection parts are electrically connected by a solder bump method.

14. The manufacturing method of the composite semiconductor device of Claim 10 or 12, characterized by the fact that after the functional surface of the above-mentioned semiconductor device with the maximum size and the nonfunctional surfaces of each of the other above-mentioned semiconductor devices are attached so that they face each other, wiring connecting parts, which are respectively installed on the functional surface of the above-mentioned semiconductor device with the maximum size and the functional surfaces of each of the other above-mentioned semiconductor devices, are electrically connected by a wire bonding method.

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